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Synthesis of Radioactive Parathion Using S^{35} [1,2]

By Jens A. Jensen and George W. Pearce

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The insecticidal compound parathion, O,O-diethyl-O-*p*-nitrophenyl thiophosphate has been prepared and radioactively labeled with S^{35}. The following steps were used

$$S^{35} + PCl_3 \xrightarrow{AlCl_3} PS^{35}Cl_3 \quad (1)$$

$$PS^{35}Cl_3 + 2C_2H_5ONa \longrightarrow (C_2H_5O)_2\text{-}P(S^{35})\text{-}Cl + 2\,NaCl \quad (2)$$

$$(C_2H_5O)_2\text{-}P(S^{35})\text{-}Cl + NaO\text{-}C_6H_4\text{-}NO_2 \longrightarrow (C_2H_5O)_2\text{-}P(S^{35})\text{-}O\text{-}C_6H_4\text{-}NO_2 + NaCl \quad (3)$$

Phosphorus thiochloride was obtained by the method described by Knotz.[3] The cooled liquid was not washed but distilled directly. Reactions (2) and (3) followed those published by Fletcher, *et al.*[4-5] Seventy-five millimoles of S containing approximately 16 millicuries of activity yielded 44.4 millimoles of parathion (59%); sp. gr. 1.26 ± 0.01; $n^{35}D$ 1.5380; specific activity, 220 microcuries per millimole.

(1) From the Communicable Disease Center, Public Health Service, Federal Security Agency, Savannah, Georgia.

(2) For detailed paper order Document 3566 from American Documentation Institute, 1719 N Street, N.W., Washington 6, D. C., remitting $1.00 for microfilm (images 1 inch high on standard 35 mm. motion picture film) or $1.00 for photocopies (6 × 8 inches) readable without optical aid.

(3) Østerr F. Knotz, *Chem. Z.* **60**, 128 (1949).

(4) J. H. Fletcher, *et al.*, *ibid.*, **70**, 3943 (1949).

(5) J. H. Fletcher *et al.*, *ibid.*, **72**, 2461 (1950).

Savannah, Ga.

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